Our Reference: PDK-100-C PATENT

SHIPPING CONTAINER AND SUPPORT DUNNAGE

CROSS-REFERENCE TO CO-PENDING APPLICATION

[0001] This application is a continuation-in-part application of co-pending application Serial Number 10/340,054 filed January 10, 2003 which claims the benefit of priority of the January 10, 2002 filing date of U.S. provisional patent application serial number 60/347,432, the contents of which are incorporated herein in their entirety.

BACKGROUND

[0002] Shipping containers for articles, workpieces, auto parts, etc., take a variety of shapes and configurations based on the size and shape of the article or part to be transported. For example, automotive parts, such as vehicle sheet metal parts, i.e., hoods, deck lids, fenders, door panels, widow glass, etc., come in numerous shapes.

[0003] One type of shipping container for transporting single articles, such as automotive parts, is a corrugated cardboard box having folded over panels which are taped or otherwise secured in a closed position.

[0004] As many automotive parts have a Class A surface finish, extra protection is required to prevent damage to the Class A finish on one or more surfaces of the part by protecting the Class A finish surface of the part from contact with the shipping container itself.

[0005] In the shipping container field, it is known to utilize dunnage to protect articles or parts in shipping containers from movement as well as from contact with the container. Such dunnage typically takes the form of foamed plastic blocks or members which are configured with openings for mounting on one edge of the article or part. The dunnage is designed for a snug fit within the shipping container or is fixed in place by means of adhesive, fasteners, etc., to prevent dislodgement and to prevent movement of the article during shipping.

[0006] Although in certain applications, the dunnage, after the part is removed from the shipping container, is returned to the manufacturing facility for reuse. More frequent, the dunnage is removed from the shipping container after the part is

removed and then discarded. In this situation, the dunnage represents an added cost to the article or workpiece since new dunnage is required for each article or part.

[0007] It would be desirable to provide a shipping container and support dunnage which adequately supports and protects an article or workpiece disposed within the shell during storage and shipping, enables easy closure of the shipping container after the article or workpiece is inserted into the container, reduces the number of dunnage pieces which come in contact with or are needed to support the article, increases the structural characteristics, impact strength or shock absorption properties of the dunnage, simplifies the shell of the container and requires a minimal amount of disposable dunnage to reduce the total article manufacturing cost. It would further be desirable to provide dunnage having the above benefits which satisfies the rigorous testing requirements of industrial manufacturers including automobile manufacturers.

SUMMARY

[0008] The present invention is a shipping container and dunnage which provides advantages over prior article shipping containers and dunnage.

[0009] In one aspect of the invention, the shipping container includes a shell including a plurality of panels which can include a base panel, a top panel and opposed side panels. At least one first support is adapted to mount over a peripheral edge of an article to support the article within the shell. The first support has a generally C-shape formed of two spaced side legs resiliently extending from one end leg. At least one second support is mounted or positioned within the shell in engagement over a peripheral edge of the particle. The second support has an inner channel opening. The channel is configured for mounting over a corner of a peripheral edge of the article.

[0010] In another aspect, the first support is movably disposed within the shell. The second pair of supports are fixedly mounted within the shell.

[0011] In another aspect, indicia means are provided on the exterior surface of the shell to facilitate to optimum positioning of a banding strap about the shell.

[0012] In another aspect, the shipping container includes a shell having a bottom panel, opposed side panels, each contiguous with one of the bottom panel

along a foldable edge, and opposed top panels contiguous with the side panels about a foldable edge. The top panels are foldable into overlapping relationship. A first pair of supports is adapted to mount over a peripheral edge of an article to support the article within the shell. The first pair of supports have a generally C-shape formed of two side legs resiliently extending from one end leg. A second pair of supports is fixedly mounted within the shell. Each of the second pairs of supports has an inner channel opening through one side of the support. The channel is configured for mounting over a corner formed in a peripheral edge of the article.

[0013] In another aspect, the invention is a support block engagable with an article for supporting the article in a shipping container. The block can be the above described C-shaped block, or the block with an inner recess or any combination thereof.

[0014] In one aspect, the at least one first support includes a single first support and the at least one second support includes a pair of second supports. In another aspect, the shipping container and dunnage blocks are configured to support and protect and automobile hood.

[0015] In another aspect, the invention is at least one support or dunnage block having an insert block positioned in the dunnage block to increase the structural integrity and impact absorption properties of the dunnage block. In another aspect, the dunnage block is made from polyurethane, polypropylene, polyethylene or any combination thereof. In another aspect , the support or dunnage block is made from polyurethane and the insert block is made from polypropylene.

[0016] The present shipping container and dunnage support provides optimum protection for an article disposed within the container, enables easy closure of the container after the article is inserted into the container and, further, utilizes a minimal amount of disposable dunnage to reduce the total article manufacturing cost.

BRIEF DESCRIPTION OF THE DRAWINGS

[0017] The description herein makes reference to the accompanying drawings wherein like reference numerals refer to like parts throughout the several views, and wherein:

[0018] Figure 1 is a partial perspective view of one aspect of the shipping container showing an automotive hood positioned in the container;

[0019] Figure 2 is a top view of the shipping container in Figure 1 in a partially assembled position;

[0020] Figure 3 is a perspective view of a first support shown in Figure 1;

[0021] Figure 4 is a perspective view of a second support shown in Figure 1;

[0022] Figure 5 is a front view of the partially assembled shipping container in Figure 1 showing the side panels and the first and second top panels in an angularly displaced orientation to the bottom panel;

[0023] Figure 6 is a perspective view of the shipping container in Figure 1 in an assembled position;

[0024] Figure 7 is a perspective view of an alternate shipping container having support dunnage and an automotive hood positioned therein;

[0025] Figure 8 is a partially cut-away perspective view of an alternate first support shown in Figure 7 including a single first support showing one of the preferred insert blocks;

[0026] Figure 9 is a left side view of the single first support in Figure 8;

[0027] Figure 10 is a rotated, partially cut-away perspective view of the single first support in Figure 8 showing the preferred dual insert blocks;

[0028] Figure 11 is a rotated perspective view of the single first support in Figure 8 including a panel attached thereto;

[0029] Figure 12 is a perspective view of an alternate second support shown in Figure 7;

[0030] Figure 13 is a perspective view of a preferred insert block for the second support shown in Figure 12;

[0031] Figure 14 is a schematic perspective view showing the insert block of Figure 13 positioned in the second support of Figure 12; and

[0032] Figure 15 is a partial top view of the shipping container shown in Figure 7.

DETAILED DESCRIPTION OF THE INVENTION

[0033] Referring to Figures 1-6, one aspect of a shipping container 10 of the present invention is illustrated. Referring specifically to Figures 1 and 2, shipping container 10 includes, by example, a shell 12, a pair of first or front supports or dunnage blocks 14 and a pair of second or rear supports or dunnage blocks 16. First 14 and second 16 supports are shown supporting an article, for example, an automotive hood 18 as best seen in Figure 1.

[0034] Referring to Figures 2 and 5, shell 12 includes a substrate 20 including a front edge 24, a rear edge 26, a first side edge 27 and a second side edge 28. The substrate 20 is divided into five sections including a bottom panel 29, two side panels 44, a first top panel 52 and a second top panel 54. The substrate 20 is generally rectangular in shape in an unfolded or unassembled position as shown in Figure 2 and is made from die-cut, heavy-duty corrugated cardboard material. It is understood that substrate 20 may alternately be any polygonal shape to fit an application and intended contents and may comprise multiple, non-connected pieces. The substrate 20 may alternately be made from other materials which include similar physical properties to rigidly contain articles. As shown in Figures 1 and 5, shipping container 10 is designed and proportioned to securely support and retain an automotive hood 18. It is understood that the shipping container 10 is adaptable for other contents or goods without deviating from the present invention.

[0035] Referring to Figures 2 and 5, bottom panel 29 is generally of square shape and is defined by front edge 24 and rear edge 26 of substrate 20. Bottom panel 29 includes a cutout 30 along both the front edge 24 and rear edge 26 at the approximate center of bottom panel 29 as seen in Figure 2. Bottom panel 29 includes a pair of bottom flanges 32 that are integral with bottom panel 29 and separated from inner edges 38 defining cutouts 30. Bottom flanges 32 include a flange edge 36 defining a length of flange 32 which does not extend beyond the front 24 or rear 26 edge of substrate 20 and is preferably distant therefrom. Bottom panel 29 further includes a first crease 34 at the intersection of both bottom flanges 32 and bottom panel 29. First crease 34 is formed by a slight deforming compression of substrate 20 along a linear path to facilitate folding or rotating bottom flanges 32 along first crease

34 in an angular orientation to bottom panel 29 as best seen in Figure 5 and described in detail hereinafter.

[0036] The pair of side panels 44 which are separated by and integral with bottom panel 29. Sides panels 44 are defined by a first side crease 46 and second side crease 48 formed in substrate 20 as previously described. First 46 and second 48 side creases are separated by a distance sufficient to accommodate the height of the desired contents and supports described below positioned in shipping container 10.

[0037] Substrate 20 further includes a first top panel 52 and a second top panel 54 which are integral with the respective side panels 44 as best seen in Figures 2 and 5. The first 52 and second 54 top panels include a second cutout 56 along the front edge 24 and rear edge 26 as best seen in Figure 2. First top panel 52 includes a first front flange 58 and a first rear flange 59 which are both integral with first top panel 52. In a similar fashion to the bottom panel, first top panel 52 includes a second crease 62 at the intersections of first front 58 and first rear 59 flanges and first top panel 52. The first front 58 and the first rear 59 flanges are also separated from an outer edge 64 to permit the respective flanges to fold or rotate in an angular orientation to first top panel 52 as best seen in Figure 5. First front 58 and first rear 59 flanges include a flange edge 66 which is positioned such that the respective flanges do not extend beyond the front edge 24 and rear edge 26 as previously described for bottom flanges 32.

[0038] In a similar fashion to first top panel 52, second top panel 54 includes a second front flange 60 and a second rear flange 61 which are integral with second top panel 54. Second top panel 54 similarly includes a second crease 62 along the linear intersections of second front flange 60 and second rear flange 61 with second top panel 54. Second front 60 and second rear 61 flanges are separated from outer edge 64 and include a flange edge 66 similar to that of the first front 58 and first rear 59 flanges as previously described. First 52 and second 54 top panels are separated from the respective side panels 44 by second side creases 48 which permit first 52 and second 54 top panels to fold or rotate along second crease lines 48 to angularly displace first 52 and second 54 top panels from the respective side panels 44 as best seen in Figures 5 and 6.

[0039] It will be understood that the above-described container 10 is by way of example only. The present invention is also usable with other container constructions including a regular slotted carton, a folded-over lap carton or a telescopic carton.

[0040] Referring to Figures 1-3 and 5, shipping container 10 preferably includes a pair of first supports 14. As best seen in Figure 3, each front support 14 includes a top surface 80, a bottom surface 82, an outer surface 84, an inner surface 86 and a first or open channel 88. Each first support 14 further includes opposing rounded portions 90 which partially obstruct first channel 88 adjacent to inner surface 86. Each first support 14, when used on the side of the component 18, further includes a 45 degree chamfer at the intersections of the top surface 80 and bottom surface 82 with the outer surface 84 as best seen in Figure 3. It is understood that chamfers 92 may be at an alternate angle from 45 degrees or may take a rounded or radiused form as opposed to a substantially flat chamfer as shown.

[0041] First supports 14 may also be positioned on the component or hood 18 closer to the center of the front edge of the hood 18. This would move each front support 14 inward toward the opposed front support 14 from the side located position shown in Fig. 1. In these so called "front edge" mounted positions of first supports 14, the chamfer 92 will not be required but may still be used to reduce weight and the amount of material needed to form the supports.

[0042] It will also be understood that the chamfer 92 for side edge mounted first supports 14 is optional. According to one aspect of the invention, first supports 14 are formed of a lower density material than the rear support 16 described hereafter. This lower density material allows front supports 14 to absorb external forces better without transferring a substantial portion of such forces to the hood 18.

[0043] As best seen in Figures 1, 2 and 5, first supports 14 are positioned on bottom panel 29 adjacent respective first side creases 46 and are distant from front edge 24 in an approximate position as shown to accommodate an automotive hood 18. In alternate aspects of the invention, additional front supports 14 may be used where desired to support, for example, less rigid components where needed to further support and protect the contents. First supports 14 are preferably made from expanded polyurethane or polypropylene cut or molded to the desired shape which, in

the described configuration, provides both rigidity to support hood 18 as well as flexibility to separate rounded portions 90 to accept hood 18 and provide a cushion to protect hood 18. Alternate materials include molded or cut expanded polystyrene and other materials that provide rigidity in a block form and substantial cushioning or shock absorption properties while permitting flexibility to insert and remove, for example, an automotive hood 18 into and out of first channel 88 as described and illustrated in Figure 1.

[0044] Referring to Figures 1, 2 and 4, shipping container 10 preferably includes, for example, a pair of second supports 16. Referring to Figure 4, each rear support 16 has a top surface 102 , a bottom surface 104, an outer surface 106, an inner surface 108, a front side 110 and a rear side 112. Each second support 16 further includes an inner channel opening 114 which is partially open to inner surface 108 and includes an undercut 116 substantially as shown. As illustrated, inner channel opening 114 is positioned and oriented in second support 16 to accept and partially retain a rear corner of an automotive hood 18 as best seen in Figure 1. Second support 16 further includes a 45 degree chamfer at the intersections of top surface 102 and bottom surface 104 with outer surface 106 and extend the entire length between the front 110 and rear 112 sides. It is understood that chamfers 118 may be at an alternate angle from 45 degrees or may take a rounded or radiused form as opposed to a substantially flat chamfer as shown. The second support 16 is preferably made from expanded polypropylene or polyurethane cut or molded to the desired shape as substantially shown in Figure 4. Alternate materials for second support 16 include those previously described for first support 14. As best seen in Figures 1 and 2, second supports 16 are positioned on bottom panel 29 adjacent to the respective first side creases 46 and rear edge 26 as substantially shown.

[0045] Referring to the shipping container 10 in Figures 1-6, The second supports 16 are preferably secured to the shell 12 by a hot melt-type adhesive 124 which is pre-applied in one or two strips or beads or other patterns to surface 104 of the second supports 16 respectively. The second supports 16 are then placed in contact with and disposed on bottom panel 29. Alternate methods to secure second supports 16 to the container 10 include adhesives other than a hot melt-type, double-

sided adhesive tapes and films, or mechanical fasteners such as staples through substrate 20 into the supports 14 and 16.

[0046] Referring to Figures 7 and 15, second supports 200 are not mounted to shell 250 but are moveable within shell 250. In an installed position in shell two, and on installation of the article, for example hood 18, second supports abut opposing side panels 264 and end panel 266 of the shell lower portion 260

[0047] Referring to Figures 1, 2 and 5, an automotive hood 18 is mounted in the first supports 14 and second supports 16. The rear corners of hood 18 are positioned in inner channel 114 and more particularly in undercut 116, and the forward, outer edges of hood 18 are positioned in open channel 88 in first supports 14 and are preferably in contact with rounded portions 90 to positively locate and retain hood 18 from lateral movement relative to bottom panel 29. Following installation of hood 18 in shipping container 10, bottom flanges 32 on bottom panel 29 are folded or rotated about first creases 34 to angularly displace bottom flanges 32 with respect to bottom panel 29 to an approximately perpendicular orientation as best seen in Figure 5. The first front 58 and first rear 59 flanges on first top panel 52 are similarly displaced in a perpendicular orientation along second creases 62. Second front 60 and second rear 61 flanges of second top panel 58 are also displaced at an angular orientation of approximately 90 degrees to second top panel 54 in a similar manner. At this stage of assembly, the two beads of adhesive 124 that were pre-applied on top surface 102 of rear supports 16, are revealed through removal of contact or release paper, not shown, to expose the adhesive as shown in Figures 1-4.

[0048] As best seen in Figures 5 and 6, side panel 44 adjacent to second top panel 54 is rotated about first side crease 46 until side panel 44 is approximately 90 degrees with respect to bottom panel 29. In this position, side panel 44 is directly adjacent to or in slight contact with outer surfaces 84 and 106 of front supports 14 and rear supports 16 supports. Second top panel 54 is then rotated or folded along second side crease 48 to angularly displace second top panel 54 at approximately 90 degrees with respect to side panel 44 thereby placing second top panel 54 in opposing and substantially parallel orientation to bottom panel 29 as best seen in Figure 6. In this position, second front 60 and second rear 61 flanges are positioned toward the

inside of the container with respect to bottom flanges 32 of bottom panel 29. In this position, adhesive 124 on rear supports 16 adjacent to second top panel 54 is compressed against second top panel 54 thereby securing second top panel 54 to the rear supports 16 and bottom panel 29. To facilitate easy angular rotation of side panel 44 and second top panel 54 with respect to bottom panel 29, chamfers 92 (optional) and 118 of front 14 and rear supports 16 respectively are utilized to accommodate variances in substrate 20 and variances in first 46 and second 48 side creases both in position of the creases and radii of the creases when folded. Chamfers 92 (optional) and 118 further accommodate variances with respect to the variable positioning or the supports 14 and 16.

[0049] First top panel 52 and side panel 44 are similarly displaced in angular orientation to bottom panel 29 along first 46 and second 48 side creases at approximately 90 degree angles to position first top panel 52 in overlapping relation to second top panel 54 and in opposing and parallel orientation to bottom panel 29 as best seen in Figure 6. In this position, adhesive 124 on the exposed top surfaces 102 of and rear supports 16 adjacent to first top panel 52 is compressed against first top panel 52 thereby securing first top panel 52 in this position similar to second top panel 54 as previously described. In this position, first front 58 and first rear 59 flanges are positioned between bottom flanges 32 of bottom panel 29 and second front 60 and second rear 61 flanges forming three thicknesses of substrate 20 in overlapping orientation to deter movement of automotive hood 18 along open 88 and inner 114 channels.

[0050] Referring to Figure 6, shell 12 optionally further includes markings or text 128 (shown in phantom) on the outer surface of substrate 20 to guide a user in applying strapping bands circumferentially around shipping container 10 to maintain the flanges 32, 58, 59, 60 and 61 in an approximately 90 degree orientation to the top and bottom panels to prevent unwanted longitudinal movement of automotive hood 18 with respect to bottom panel 29 and to prevent further angular disposition of side panels 44 or matchboxing of the assembled shipping container 10. As shown in Figure 6, in a fully assembled position, through openings 126 exist which provide a free flow of air and circulation in shipping container 10 and around the contents, for

example, automotive hood 18. Adhesive 124 on the front and rear supports 14 and 16 prevent the supports 14 and 16 from dislodging from the hood 18 and inadvertently exiting the shipping container 10.

[0051] Referring to Figures 7-15, an alternative shipping container 10 and support or dunnage blocks 140 and 200 of the present invention are illustrated. Figure 7 shows a shipping container 10 including a single first support or dunnage block 140, a pair of second supports or dunnage blocks 200 and an alternate shell 250 having a bottom portion 260 and a cover portion 270.

[0052] Referring to Figures 7 and 15, an alternate shell 250 is illustrated. Shell 250 includes a bottom portion 260 having a generally rectangular bottom panel 262, opposing side panels 264 and an end panel 266 continuous with bottom panel 262. Shell 250 further includes a top cover portion 270 having a complimentary top panel 272, opposing side panels 274 and an end panel 276 continuous with top panel 272. Top cover portion 270 is sized and configured such that when rotated about end panel 266 and positioned over bottom portion 250, down-folded side panels 274 and end panel 266 overlappingly engage upturned bottom portion side panels 264 thereby enclosing article 18 within shell 250. The cover portion 270 is secured in place by flange 278 attaching to the underside of bottom panel 262 (not shown). As with shell 12, shell 250 is exemplary only and can be any polygonal shape, configuration and material suitable for the desired article and dunnage supports to be used therewith to be shipped or stored.

[0053] Referring to Figures 7-11, an alternate first support or dunnage block 14 may comprise a single first support 140. Single first support 140 is preferably positioned along the front peripheral edge of the article, for example, hood 18, at the approximate center of the hood as shown in Figure 7. As best seen in Figures 8 and 9, first support 140 includes a top surface 142, bottom surface 144, an inner surface 146, outer surface 148 , and opposing sides 150. First support 140 includes a first leg 154 and second leg 156 both extending from an end leg 158 as best seen in Figure 8. First leg 154 and second leg 156 define an open channel 162 including an angled first portion 164 and second portion 166 which intersect as shown in Figures 8 and 9. Second portion 166 preferably includes a step 168 adjacent the intersection. Open

channel 162, angled first portion 164, second portion 166 and step 168 are configured to mount over a portion of a peripheral edge of, for example, hood 18 as shown in Figure 7.

[0054] Referring to Figure 8, first support 140 preferably includes a first groove 172 positioned on inner surface 146 of second leg 156. First groove 172 includes 45° slanted surfaces 175 intersecting an inner face 176. In use with an automotive hood 18, first groove 176 is configured and positioned to accept the hood latch (not shown) of hood 18 and further function to deter lateral movement of the hood 18 with respect to center support 140. It is understood that first groove 172 may take different shapes, forms suitable for acceptance of latches, hardware and other features of the article disposed in shell 250.

First support 140 preferably includes a second groove 180 including 45° slanted surfaces 182 intersecting an inner surface 184 as well as 45° chamfers 186 as best seen Figure 8. These features are primarily for reductions in weight and in the material needed to manufacture the support while maintaining the desired structural and impact absorption properties. It is understood that second groove 180 and chamfers 186 may take other shapes and forms suitable for the application or may be eliminated altogether.

[0055] Referring to Figure 11, first support 140 preferably includes a panel 194 mounted to the outer surface 148 of first support 140. Panel 194 is configured to assist in the positioning of first support 140 in shell 250 and deters lateral movement of support 140 in shell 250. Panel 194 is made from corrugated cardboard and has a crease 196 providing for controlled bending or distortion of the panel 194 for positioning and stability purposes. Panel 194 may be mounted to first support 140 by gluing, taping, stapling, staking or other suitable means.

[0056] First support 140 is preferably made from expanded polyurethane cut or molded to the desired shape having a density in the range from about 1.5 lbs/ft^3 to 3.0 lbs/ft^3. In a most preferred aspect, the polyurethane density is from about 2.1 lbs/ft^3 to about 2.8 lbs/ft^3. A suitable but exemplary polyurethane foam for first support 140 is INSTPAK G-FLEX foam manufactured by Sealed Air Corporation. In an alternate aspect, first support 140 can be made from expanded polypropylene cut

or molded to the desired shape having a density in a range from about 1.8 lbs/ft^3 to 3.2 lbs/ft^3. When polypropylene is used for support 140, the most preferred density is from about 2.5 lbs/ft^3 to about 3.1 lbs/ft^3. A suitable but exemplary polypropylene for support 140 is manufactured by BASF under the trademark NEOPOLEN P in the densities described above.

[0057] Referring to Figures 8-10, first support 140 includes two first insert blocks 192 positioned in end leg 158 as shown. First insert blocks 192 are, for example, polygonal in shape and are made from expanded polypropylene cut or molded to the desired shape having a density in a range from about 1.8 lbs/ft^3 to 3.2 lbs/ft^3. In a most preferred aspect, the polypropylene has a density from about 2.5 lbs/ft^3 to about 3.1 lbs/ft^3. First insert blocks 192 are insert molded into first support 140 in the approximate locations in end leg 158 as shown. A suitable polypropylene for insert block 192 is manufactured by BASF under the trademark NEOPOLEN P in the densities described above. In an alternate aspect, insert blocks 192 are made from polytheylene having a density in a range from about 2 lbs/ft^3 to about 9 lbs/ft^3

[0058] In a most preferred aspect, support 140 is made from polyurethane and insert blocks 192 are made from polypropylene in the most preferred density ranges described above.

[0059] It is understood that one or more supports 140 may be used to support an article and the placement on the article and the position in shell 250 may vary depending on the application. It is further understood that a single or additional insert blocks 192 may be used and their size, shape and configuration may vary to suit center support 140 or first support 14 to suit the application. Referring to Figures 7 and 12-14, alternate second supports or dunnage blocks 200 are shown. Second support 200 include a top surface 202, bottom surface 204 , inner surface 206, outer surface 208, a front side 209 and a rear side 210. Second supports 200 have an inner channel opening 212, a chamfer 214 and an undercut (not shown) as previously described and illustrated for alternate second support 16. Second support 200 preferably includes third grooves 216 and chamfers 222 on top 202 and bottom 204 surfaces having slanted surfaces 218 and inner surfaces 220 similar to second groove 180 and chamfers 186 in center support 140.

[0060] It is understood that third grooves 216 and chamfers 222 may be of different shapes, sizes and orientation then that as shown to suit the application or eliminated altogether without deviating from the present invention. It is also understood that inner channel 212 may also vary in size, shape and orientation to suit the application. It is further understood that a single or additional second supports 200 may be used to suit the particular application.

[0061] Each second support 200 preferably includes a second insert block 224 as shown in Figures 13 and 14. Second insert block 224 includes a top surface 226, bottom surface 228, inner surface 230, outer surface 232 and opposing sides 234. Second insert block 224 preferably includes an inner slot 236 which is positioned and configured to accommodate inner channel 212 of the second support 200 as best seen as assembled in Figure 14. Second insert 224 is preferably made from expanded polypropylene or polyethylene cut or molded to the desired shape as previously described for first insert 192 and is insert molded into second support 200 as shown in Figure 14. When second insert 224 is used in second support 200, second support 200 is preferably made from polyurethane as previously described for first support 140.

[0062] It is understood that one or more second inserts 224 may be used in second support 200 to suit the application or desired characteristics, or as shown in the alternate second support 16, not used at all. It is further understood that different materials other than polyurethane, polypropylene or polyethylene and in different densities than those described above for the dunnage supports and insert blocks may be used to provide the desired characteristics described herein without deviating from the present invention.

[0063] In a preferred aspect, first center support 140 having the first inserts 192 is used together with second supports 200 having second insert 224 and shell 250 to comprise a shipping container 10.

[0064] Referring to Figures 7 and 15, in an alternate aspect, the article, for example, an automobile hood 18 is positioned in bottom shell portion 260 and into inner channels 212 in second supports or dunnage blocks 200 and in the open channel 162 in first support or dunnage block 140 as substantially described above. Shell

cover portion 270 is positioned over bottom portion 250 to enclose hood 18 in shipping container 10. Cover portion 270 is secured to bottom portion 250 by strapping, taping, gluing, stapling or other suitable means for shipment and storage.

[0065] In summary, there has been disclosed a unique shipping container and dunnage supports which are designed for easy closure, optimum article support and protection and minimal disposable dunnage for a low article manufacturing cost.